

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A miniature fiberoptic filter comprising
a first optical fiber;
a first multimode optical fiber segment attached to an end of said first optical fiber, said
first multimode optical fiber segment having a step index of refraction and axially aligned with
said first optical fiber, said first multimode optical fiber segment having a first length;
a second multimode optical fiber segment attached to said first multimode optical fiber
segment, said second multimode optical fiber segment having a graded index of refraction core
and axially aligned with said first multimode optical fiber segment, said second multimode
optical fiber segment having a second length, said first and second lengths selected to define a
collimation and focusing function for light from and to said first optical fiber;
a plurality of dielectric coatings directly on an endsurface of said second multimode
optical fiber segment opposite said first multimode optical fiber segment, said plurality of
dielectric coatings forming a wavelength-dependent optical filter;
a second optical fiber;
a third multimode optical fiber segment attached to an end of said second optical fiber,
said third multimode optical fiber segment having a step index of refraction and axially aligned
with said second optical fiber, said third multimode optical fiber segment having a third length;
and
a fourth multimode optical fiber segment attached to said third multimode optical fiber
segment, said fourth multimode optical fiber segment having a graded index of refraction core
and axially aligned with said third multimode optical fiber segment, said fourth multimode
optical fiber segment having a fourth length, said third and fourth lengths selected to define a
collimation and focusing function for light from and to said second optical fiber, said fourth
multimode optical fiber segment having an endsurface opposite said third multimode optical
fiber segment **and** facing said endsurface of said second multimode optical fiber segment and

abutting said plurality of dielectric coatings on said endsurface of said second multimode optical fiber segment;

said first optical fiber, said first multimode optical fiber segment, said second multimode optical fiber segment, said plurality of dielectric coatings, said second optical fiber, said third multimode optical fiber segment, said fourth multimode optical fiber segment arranged and oriented with each other so light from said core of said first optical fiber passing through said plurality of dielectric coatings enters said core of said second optical fiber.

Claim 2 (original): The miniature fiberoptic filter of claim 1 comprising a cylindrical package holding an end section of said first optical fiber, said first multimode optical fiber segment, said second multimode optical fiber segment, an end section of said second optical fiber, said third multimode optical fiber segment, said fourth multimode optical fiber segment, said cylindrical package having an outside diameter less than 0.4 mm.

Claim 3 (previously presented): The miniature fiberoptic filter of claim 2 wherein said cylindrical package comprises a metal sleeve engaging portions of said end sections of said first and second optical fibers, each portion having a metal coating closely engaging said metal sleeve.

Claim 4 (original): The miniature fiberoptic filter of claim 3 wherein said cylindrical package has a circular cross-section.

Claim 5 (previously presented): The miniature fiberoptic filter of claim 3 wherein each metal coating is fixed to said metal sleeve.

Claim 6 (previously presented): The miniature fiberoptic filter of claim 5 wherein each metal coating is fixed to said metal sleeve by a laser solder.

Claim 7 (previously presented): The miniature fiberoptic filter of claim 5 wherein each metal coating is fixed to said metal sleeve by a laser weld.

Claim 8 (original): The miniature fiberoptic filter of claim 1 wherein said plurality of dielectric coatings form a low-pass filter.

Claim 9 (original): The miniature fiberoptic filter of claim 1 wherein said plurality of dielectric coatings form a high-pass filter.

Claim 10 (original): The miniature fiberoptic filter of claim 1 wherein said plurality of dielectric coatings form a bandpass filter.

Claim 11 (original): The miniature fiberoptic filter of claim 1 wherein said end of said second multimode optical fiber segment is angled from a plane perpendicular to a longitudinal axis of said second multimode optical fiber segment.

Claim 12 (previously presented): The miniature fiberoptic filter of claim 11 wherein said end of said fourth multimode optical fiber segment is reciprocally angled with respect to said end of said second multimode optical fiber segment.

Claim 13 (currently amended): A method of manufacturing a miniature fiberoptic filter comprising

fixing first and second multimode fiber segments to a first optical fiber end section, said first multimode fiber segment between said first optical fiber end section and said second multimode fiber segment, said first multimode fiber segment having a step index of refraction and said second multimode fiber segment having a graded index of refraction core;

selecting lengths of said first and second first and second multimode fiber segments to define a collimation and focusing function for light from and to said first optical fiber end section;

depositing a plurality of dielectric layers directly upon an end surface of said second multimode fiber segment opposite said first multimode fiber segment, said plurality of dielectric layers defining a wavelength- dependent filtering function;

fixing third and fourth multimode fiber segments to a second optical fiber end section, said third multimode fiber segment between said second optical fiber end section and said fourth multimode fiber segment, said third multimode fiber segment having a step index of refraction and said fourth multimode fiber segment having a graded index of refraction core;

selecting lengths of said third and fourth multimode fiber segments to define a collimation and focusing function for light from and to said second optical fiber end section; and

arranging and orienting said first optical fiber end section and fixed first and second multimode fiber segments with said second optical fiber end section and fixed third and fourth multimode fiber segments so that said fourth multimode fiber segment abuts said plurality of dielectric layers and so that light from a core of said first optical fiber end section passing through said plurality of dielectric coatings enters a core of said second optical fiber end section.

Claim 14 (original): The method of claim 13 further comprising angle-polishing said end surface of said second multimode fiber segment and an end surface of said fourth multimode fiber segment opposite said third multimode fiber segment so that said end surfaces are angled from a perpendicular to a longitudinal axis of said second and fourth multimode fibers segments respectively.

Claim 15 (original): The method of claim 14 wherein said angle-polishing step comprises simultaneously angle-polishing end surfaces of a plurality of multimode fiber segments in a fixture having an angle-polishing guide surface at an angle to a perpendicular plane to said plurality of multimode fiber segments in said fixture.

Claim 16 (previously presented): The method of claim 15 wherein said angle-polishing step comprises simultaneously angle-polishing end surfaces of at least 300 multimode fiber segments.

Claim 17 (original): The method of claim 13 wherein said first and third multimode fiber segments comprise step index multimode fiber segments, and wherein said selecting steps comprise selecting lengths of said first and third multimode segments approximately 610 μ m.

Claim 18 (original): The method of claim 13 wherein said second and fourth multimode fiber segments comprise graded index fiber segment, and wherein said selecting steps comprise selecting lengths of said second and fourth multimode segments approximately 135 μ m.

Claim 19 (original): The method of claim 13 further comprising forming metal coating over predetermined portions of said first and second optical fiber end sections; and

fitting a metal sleeve over said first optical fiber end section with said fixed first and second multimode fiber segments and said second optical fiber end section with said fixed third and fourth multimode fiber segments; and

fixing said metal sleeve to said metal coatings.

Claim 20 (original): The method of claim 19 wherein said fitting step comprises selecting a metal sleeve having an outside diameter less than 0.4 mm.

Claim 21 (new): A method of manufacturing a miniature fiberoptic filter comprising forming metal coatings over predetermined portions of first and second optical fiber end sections;

fixing first and second multimode fiber segments to said first metal-coated optical fiber end section, said first multimode fiber segment between said first metal-coated optical fiber end section and said second multimode fiber segment, said first multimode fiber segment having a step index of refraction and said second multimode fiber segment having a graded index of refraction core;

selecting lengths of said first and second first and second multimode fiber segments to define a collimation and focusing function for light from and to said metal-coated first optical fiber end section;

depositing a plurality of dielectric layers directly upon an end surface of said second multimode fiber segment opposite said first multimode fiber segment, said plurality of dielectric layers defining a wavelength- dependent filtering function;

fixing third and fourth multimode fiber segments to said second metal-coated optical fiber end section, said third multimode fiber segment between said second metal-coated optical fiber end section and said fourth multimode fiber segment, said third multimode fiber segment having a step index of refraction and said fourth multimode fiber segment having a graded index of refraction core;

selecting lengths of said third and fourth multimode fiber segments to define a collimation and focusing function for light from and to said second metal-coated optical fiber end section; and

arranging and orienting said first metal-coated optical fiber end section and fixed first and second multimode fiber segments with said second metal-coated optical fiber end section and fixed third and fourth multimode fiber segments in a metal sleeve so that said fourth multimode fiber segment abuts said plurality of dielectric layers and so that light from a core of said first optical fiber end section passing through said plurality of dielectric coatings enters a core of said second optical fiber end section.

Claim 22 (new): The method of claim 21 further comprising fixing said metal sleeve to said first and second metal-coated of optical fiber end sections.

Claim 23 (new): The method of claim 21 wherein said fitting step comprises selecting a metal sleeve having an outside diameter less than 0.4 mm.

Claim 24 (new): The method of claim 21 further comprising angle-polishing said end surface of said second multimode fiber segment and an end surface of said fourth multimode fiber segment opposite said third multimode fiber segment so that said end surfaces are angled from a perpendicular to a longitudinal axis of said second and fourth multimode fibers segments respectively.

Claim 25 (new): The method of claim 24 wherein said angle-polishing step comprises simultaneously angle-polishing end surfaces of a plurality of multimode fiber segments in a fixture having an angle-polishing guide surface at an angle to a perpendicular plane to said plurality of multimode fiber segments in said fixture.

Claim 26 (new): The method of claim 25 wherein said angle-polishing step comprises simultaneously angle-polishing end surfaces of at least 300 multimode fiber segments.

Claim 27 (new): The method of claim 21 wherein said first and third multimode fiber segments comprise step index multimode fiber segments, and wherein said selecting steps comprise selecting lengths of said first and third multimode segments approximately 610 μ m.

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Claim 28 (new): The method of claim 21 wherein said second and fourth multimode fiber segments comprise graded index fiber segment, and wherein said selecting steps comprise selecting lengths of said second and fourth multimode segments approximately 135 μ m.